



13th INTERNATIONAL SYMPOSIUM ON FUELS AND LUBRICANTS

MARCH 17-19, 2023

**Theme: Fuels & Lubricants as
Enablers for Net-Zero Goal**

Organized by



IndianOil *The Power of Possibilities*

Under the aegis of



Indian Society on Fuels and Lubricants

SOUVENIR





ISFL 2023: Program at a Glance

March 17, 2023 (Friday)			March 18, 2023 (Saturday)			March 19, 2023 (Sunday)		
Registration (0800 hrs onwards) Tea (0800-0915 hrs)			Plenary Session - II (0900-1030 hrs)			Technical Session – V (0900-1015 hrs)		
Inauguration Symposium, Exhibition & Posters (1000-1115 hrs)						TS V A EV fluids	TS V B H2 as future fuel	TS V C Greases
Plenary Session - I (1130-1300 hrs)			Tea			Tea		
Lunch			Panel Discussion- II (1045-1215 hrs)			Plenary Session – IV (1030-1200 hrs)		
Panel Discussion-I (1345-1515 hrs)			Plenary Session - III (1215-1345 hrs)			Valedictory Session (1215-1315 hrs)		
Tea			Lunch			Lunch		
Technical session – I (1545-1715 hrs)			Technical Session – III (1430-1600 hrs)					
TS I A	TS I B	TS I C	TS III A	TS III B	TS III C			
AO-I	Oxygenated Fuels	Industrial Lubricants	NG & Lubricants	Bio-technology	Metal Working Oils			
Tea			Tea					
Technical Session – II (1730-1900 hrs)			Technical Session – IV (1615-1745 hrs)					
TS II A	TS II B	TS II C	TS IV A	TS IV B	TS IV C			
AO-II	Fuel Testing & Additives	Circular Economy	Base Oil & Additives	Alternative Fuels	Refining Technology			
e-Poster Session – I (1230 – 1600 hrs)			e-Poster Session – III (1230 – 1600 hrs)					
e-Poster Session – II (1600 – 1900 hrs)			e-Poster Session – IV (1600 – 1900 hrs)					
Networking Dinner (1900 – 2100 hrs)			Cultural Program & Conference Dinner (1930 – 2200 hrs)					

Venues of different sessions	
Tango-I	Technical Session I-A, II-A, III-A, IV-A and V-A
Tango-II	Technical Session I-B, II-B, III-B, IV-B and V-B
Tango-III	Technical Session I-C, II-C, III-C, IV-C and V-C
Debate	Posters
Main Hall (Tango)	All other sessions

Disclaimer: ●●●●●●●●

This book is updated until 1600 hrs, 14.03.2023 (at the time of going to the press)

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**25 Years of Energising
Fuels & Lubricants Industry**



National Steering Committee of ISFL 2023

Patron	Shri S.M. Vaidya, Chairman, IndianOil
Chairman	Dr. S.S.V. Ramakumar, Director (R&D), IndianOil
Convener cum Organizing Secretary	Mr. Mukul Maheshwari, CGM I/c (LT), IndianOil R&D

Members

Sh. R.K. Mohapatra, Director (HR), IndianOil	Sh. PK Banerjee, ED, SIAM
Sh. V. Satish Kumar, Director (M), IndianOil	Dr Reji Mathai, Director, ARAI
Ms. Sukla Mistry, Director (R), IndianOil	Sh. Krishnan Sadagopan, Sr. VP, Ashok Leyland
Dr. Madhusudan Sau, ED(RT), IOC R&D	Dr Tapan Sahoo, ED, Maruti Suzuki
Dr. C. Kannan, ED (CT & TPF), IOC R&D	Sh. Y P Rao, Advisor, Gulf Lubricants
Sh. R. Udaya Kumar, ED (Lubes), IOC (M)	Smt. Pamela Tikku, CBO, iCAT
Sh. Gurmeet Singh, DG, FIPI	Sh. Debashis Ganguli, CGM(P&AD-Lubes), BPCL
Sh. Srinivasan Venkatragavan, Country Head, AFTON	Sh. Rajendra Petkar, CTO, Tata Motors
Sh. Sanjeev Kaul, Managing Director, LIPL	Sh Venkatesh R, MD, Wartsila India
Sh. Sandeep Khare, Head S&M, Indian Additives Ltd.	Sh. Sanjay Kumar, ED (Lubes), HPCL
Sh. S.K. Raghuram, Director, Infineum India	Sh Rama Prabhu, Head (Fluids Tech), Mahindra & Mahindra
Sh. Adika Ratna Sekhar, CMD, Balmer Lawrie	Sh. Sudhir Sachdeva, MD, Siddharth Grease and Lubes
Sh. Ashok Sambandam, Business Director, BASF India	

Core Committee:	Secretariat Committee:
Mr. Mukul Maheshwari, CGM I/c (LT)	Dr. Ajay Arora, GM (F&A)
Dr J Christopher, CGM (AD&PJ)	Dr. Kavita Rai, DGM (IL)
Dr Pankaj Bhatnagar, CGM (LT- Automotive)	Dr. P Sakthivel, SRM (AR)
Mr Ajay Kumar Harinarain, CGM (LT- Industrial)	Dr. Ratnadeep Joshi, SRM (AO)

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Secretary



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March 1, 2023

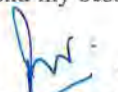
India's presidency of the G20 this year has the theme of '*Vasudhaiva Kutumbakam* – One Earth, One Family, One Future'. The theme reflects a call to action that we come together and commit to an inclusive, ambitious, and action-oriented agenda that promotes the well-being and prosperity of global citizens. India is already on the pathway of attaining Net-Zero by 2070 by decarbonisation of various industry sectors and increasing the share of renewables in the primary energy mix.

In furtherance of these sustainability goals, Government has undertaken various initiatives recently, such as, the National Mission on Green Hydrogen, sale of 20% Ethanol blended Petrol, Solar Domestic Cook Stove, capacity augmentation of Renewable Energy etc. Yet, even as India takes rapid strides towards a Net-Zero era, oil and gas continue to be critical in the interim. The Internal Combustion Engine continues to be the mainstay of mobility. Lubricants will continue to be vital for hydrocarbon origin fuels as well as biofuels.

I understand that the ISFL symposium provides a rich & engaging platform to share knowledge and latest developments in the area of fuels & lubricants with an aim to reduce carbon footprint. Conducted biennially, ISFL holds deliberations on diverse topics related to the energy sector catering to different industries such as automotive and industrial including steel, cement, railways, renewable, power etc.

I am happy to note that the 13th edition of the International Symposium on Fuels and Lubricants (ISFL 2023) is being organized by ISFL Society with the theme of "Fuels & Lubricants as Enablers for Net Zero Goal". I am confident that the researchers, technocrats, policy makers from worldwide will discuss emerging trends, future energy requirements and technology advancements leading to Net Zero.

My compliments to ISFL for energising the fuel & lubricant sectors for the last 25 years with effective engagement in terms of knowledge dissemination. I extend my best wishes for fruitful and intensive deliberations at ISFL - 2023.


[Pankaj Jain]



एस. एम. वैद्य
अध्यक्ष

S. M. Vaidya
Chairman

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**Message from Chairman for the
13th International Symposium on Fuels and Lubricants**

"Coming together is a beginning, staying together is progress, and working together is success." - Henry Ford

The International Symposium on Fuels and Lubricants (ISFL) has emerged as a vibrant platform that brings together the stalwarts and thought-leaders from the lubricant & fueling sector to facilitate knowledge-sharing, insights-churning, and fruitful exchanges on innovative practices. This year, we are delighted to present the 13th edition of the ISFL, between March 17-19, 2023, in Delhi. This edition of ISFL is particularly special since it comes against the backdrop of the completion of 25 golden years since the first ISFL symposium was held in 1997.

This Symposium serves as a testament to the dedication and innovation of the Indian fuels and lubricants industry and has emerged as a powerful platform for showcasing the considerable advancements in the Indian fuels and lubricants sector to the world. Scientists, lube formulators, technocrats, and researchers huddle on this international platform to deliberate on diverse topics of industrial relevance, including base oil manufacturing technologies, new technology-based solutions for fuels and lubricants, emerging trends in automotive and industrial oils, new lubricants for gas-fueled engines and much more.

The theme of ISFL 2023 is '*Fuels & Lubricants as enablers for Net Zero Goal*', that aptly reflects the increasing green consciousness of the fuels and lubricants sector. Given the industry's transitional state, this theme will accelerate groundbreaking deliberations on a host of new-gen fuel options, such as renewables, electric mobility, oxygenated fuels, natural gas and green hydrogen. I am sure that research scientists, industry leaders and policymakers are eagerly looking forward to the Symposium.

I urge all the delegates to participate in the proceedings actively and leverage this opportunity to gain valuable insights and exchange fresh ideas. Let us come together, stay together, and work together to drive the fuels and lubricants industry towards a sustainable future and a net-zero world.

Shrikant Madhav Vaidya
Chairman, Indian Oil
Patron, National Steering Committee, ISFL 2023

New Delhi
05-Mar-2023



डॉ. एस एस वी रामाकुमार
निदेशक (अनुसंधान एवं विकास केन्द्र)
एवं सदस्य इंडियन ऑयल बोर्ड

Dr. S S V Ramakumar
Director (R&D) & Member of Indian Oil Board

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Message

I am delighted to be a part of the organization of ISFL 2023 – the 13th International Symposium of Fuels & Lubricants 2023 - being organized by IndianOil R&D under the aegis of ISFL Society. The symposium is being organized at Hotel Vivanta by Taj, Surajkund, Delhi NCR during March 17-19, 2023. It's a matter of great pride for all of us that this conference has evolved into one of the most sought after biennial events in the downstream hydrocarbon sector since its launch in 1997. I am fortunate to be engaged with all editions of ISFL Symposium conducted during the last 25 years, delivering my responsibilities in different roles.

This edition of the ISFL symposium, based on the theme "*Fuels & Lubricants as enablers for Net Zero Goal*," is expected to bring forth innovative solutions to develop the ecosystem for energy-efficient and low carbon mobility. Automobile industry, globally, is facing challenging times due to a plethora of exciting developments such as RDE & related emission reduction commitments, evolving Euro-VII norms for mobility sector, etc. Further, biofuels like ethanol, CBG, LNG, hydrogen and e-mobility are being actively pursued by auto companies with an eye on decarbonization. I am delighted to share that the extensive representation of Indian OEMs in ISFL 2023 will highlight and enable oil companies to dispense the form of energy that the customers would require in near future.

While the world is aspiring for Net Zero, every entity is thriving to adjust the way of doing business aligning to this clarion call. The energy sector in general and Fuels & Lubricants Segment in particular, is no different. Let us join hands and charter a new path to ascertain how Fuels & Lubricants can play a role as enablers for Net Zero Goal, in this edition of ISFL 2023.

I extend my sincere greetings and best wishes for successful organization of ISFL 2023. I am sure that the infusion of new ideas, discussions and deliberations during the conference will play a vital role in propelling the fuels and lubricants sector to new heights.

(Dr SSV Ramakumar)
Chairman, NSC, ISFL 2023



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Mukul Maheshwari
Chief General Manager I/c (LT)

Message

As the Convener-cum-Organizing Secretary of ISFL 2023, I welcome all the delegates to the 13th edition of the International Symposium on Fuels and Lubricants (ISFL 2023) being organized during March 17-19, 2023 on the theme "Fuels & Lubricants as enablers for Net Zero Goal." This biennial event is organized by IndianOil R&D, under the aegis of ISFL Society.

On behalf of the National Steering Committee and my own behalf, I extend a very warm welcome to all the distinguished delegates, exhibitors, sponsors, speakers who are participating in this event. True to its stature, 13th edition is slated to have more than 145 technical papers to be presented in three concurrent sessions over next three days on varying aspects of fuels, lubricants, alternative energy, hydrogen, e-mobility etc. About 30 overseas delegates are expected to participate in the deliberations besides Indian delegates. Symposium will be enriched by four plenary sessions devoted to fuels, lubricants, oxygenated fuels & E-mobility and two panel discussions covering the contemporary topics on fuels and lubricants.

ISFL 2023 will be an opportunity for sharing expertise and views with renowned speakers from all over the world and I am sure that the participants of the symposium will be benefited and enriched with new technical inputs in their specific domains and also cherish out hospitality.

It is privileged duty of ISFL 2023 organizing team to make your stay comfortable at Surajkund and soak you in 'trade-mark' Indian hospitality. Once again, I welcome all delegates to Surajkund and wish symposium a thriving success.

With best wishes,

(Mukul Maheshwari)
Convener-cum-Organizing Secretary, ISFL 2023
CGM I/c (LT), IndianOil R&D



ISFL 2023 Program

March 17, 2023 (Friday) – Schedule

Inaugural Session (1000-1130 hrs) (Venue: Main Hall (Tango))		
1000-1005 hrs	Invocation	
1005-1010 hrs	25 Years of ISFL Journey - Movie Clip	
1010-1020 hrs	Welcome address and introduction of ISFL 2023	Dr SSV Ramakumar Chairman, NSC, ISFL 2023 & Director(R&D), IndianOil
1020-1030 hrs	Keynote Address	Shri Mark Davies Senior Director R&D – LZA Strategic Technology, Lubrizol UK
1030-1045 hrs	Theme Address	Shri Shrikant Madhav Vaidya Patron, NSC, ISFL 2023 & Chairman, IndianOil
1045-1110 hrs	Release of ISFL 2023 Souvenir and Abstract Book, Declaration of event as Carbon-Neutral & Inaugural address by Chief Guest	Shri Pankaj Jain Secretary, MoP&NG, Govt. of India
1110-1115 hrs	Vote of Thanks	Shri Mukul Maheshwari Convener-cum-Organizing Secretary, ISFL 2023
1115-1120 hrs	Inauguration of Technical Exhibition	Shri Pankaj Jain Secretary, MoP&NG, Govt. of India
1120-1130 hrs	Inauguration of e-Poster Session	Shri Shrikant Madhav Vaidya Chairman, IndianOil

Tea

Plenary Session I (1130-1300 hrs) Lubricants as Enablers for Net Zero (Venue: Main Hall (Tango)) Session Chair: Dr S P Srivastava, Former ED, IOCL		
Mr Bruce Royan Operational Marketing Director, Infineum		Lubricants Value Chain – Transforming to grow sustainably
Mr. Mark Davies Senior Director R&D – LZA Strategic Technology, Lubrizol UK		Lubricants as enablers on the journey to net zero
Dr Rhishikesh V. Gokhale Global Technical Director (Additives), Evonik Oil Additives		Supporting India's drive for efficiency : e-drive fluid design for maximum efficiency and durability
Mr Anand Bhargav Global Segment Manager, Chevron Oronite, Singapore		Hybrid trends and solutions

Lunch

Panel Discussion I (1345-1515 hrs) Clean Environment Imperatives (Venue: Main Hall (Tango))		
Mr P K Banerjee (Speaker & Moderator) Chief Executive Director, SIAM		Auto Industry roadmap on cleaner mobility
Mr Sachin Agarwal Senior Vice President, VECV		Clean energy options for commercial vehicles – Opportunities & challenges
Mr Rama Prabhu Head, Fluid Technology, Mahindra & Mahindra		Clean energy mix & new technologies in passenger car & HD segment
Mr. Sanjay Kumar ED (Lubes), HPCL		Contemporary trends in automotive lubricants
Mr Alok Trigunayat Executive Director, Ecocat India Pvt. Ltd.		Exhaust after-treatment technologies for cleaner mobility

Tea

March 17, 2023 (Friday)

Technical Session I (1545-1715 hrs)

TS I A : Automotive Oils-I (Venue: Tango-I) Session Chair: Mr R Udaya Kumar, ED(Lubes), IOCL	
257	Supporting India's drive for fuel economy: Comb polymer technology for engine oils Dr Rhishikesh V. Gokhale , Evonik Oil Additives
277	Balancing durability and catalyst compatibility for future motorcycle engine oil applications Mr Sandeep Pawar , Lubrizol India Pvt. Ltd.
332	Fuel Economy improvement in HDD Lubricants Mr Lalit Madan , Infineum India Additives Pvt. Ltd.
330	Fuel-efficient axle lubricants Mr Satya Pathak , Afton Chemical Ltd.
502	Development of green combo lubricant solution for heavy duty commercial vehicles: A step towards reducing carbon footprints from the existing vehicle fleet Dr Sarita Seth , Indian Oil Corporation Ltd. R&D Centre

TS I B - Oxygenated Fuels (Venue: Tango-II) Session Chair: Mr M Satyanandan, VP, Ashok Leyland	
313	Performance and emissions evaluation of a Di engine using methanol-diesel blends for heavy commercial vehicle engine Mr Senthil Kumar G , Ashok Leyland Ltd
352	Ethanol diesel blends – review, experience and way forward for India Dr. Robert Paulmer , MIWrk Pte Ltd.
231	Effect of diesel-ethanol blends on the performance and emissions of a CI diesel engine suitable for stationary application Mr Rahul Garg , Bharat Petroleum Corporation Ltd.
339	Effect of microbial growth on fuel characteristics of biodiesel-diesel blend Dr Manoj Kumar Upreti , Indian Oil Corporation Ltd. R&D Centre.
309	Performance of a diesel engine using ED fuel Mr Senthil Kumar G , Ashok Leyland Ltd.

TS I C : Industrial Lubricants (Venue: Tango-III) Session Chair: Mr Ajay Kr Harinarain, CGM, IOC R&D	
276	Enabling industrial gear oil towards "net zero goal" Mr Thierry Douchy , Lubrizol
259	Energy savings are just an oil change away Mr Thilo Krapfl , Evonik Oil Additives
220	Power plant lubrication reliability Mr Anshuman Agrawal , Minimac Systems Pvt Ltd.
329	Troubleshooting compressor lubrication issue at GNFC WNA-II plant Bharuch: A case study Mr Rajin R Khandpur , GNFC Ltd.
326	Energy efficient refrigeration compressor oils: Enablers for net zero Mr Saagar Kondaguli , Indian Oil Corporation Ltd.



March 17, 2023 (Friday)

Technical Session II (1730-1900 hrs)

TS II A: Automotive Oils - II (Venue: Tango-I) Session Chair: Mr Rajesh Nambiar, CGM (TS), IOCL	
215	Sustainable source based ester amide additives for lubricants Dr D. Boudreau , Vanderbilt Chemicals, LLC,
251	The performance of low viscosity engine oils with MoDTC under hybrid electric vehicles Mr Shinji Iino , ADEKA Corporation
236	Fuel efficient additive package technology for new generation motorcycle engine oils. Dr Udayashankar Bhat , Infineum India Additives Pvt. Ltd.
205	Evaluation of long term energy efficiency in automotive gear oils using friction modifiers and viscosity modifiers Mr Botta Sudhakar , Gulf Oil International, Global R&D Centre.
221	Effect of compatibiliser chemistry on performance of synthetic industrial and automotive gear oils Dr Amitabh Kumar Jain , Hindustan Petroleum Corporation Ltd.

TS II B : Fuel Testing & Additives (Venue: Tango-II) Session Chair: Dr Ajay Arora, GM(F&A), IOC R&D	
256	Dorf Ketal performance fuel additives - novel fuel additives technology for sustainability Mr Bharat Joisar , Dorf Ketal Pvt. Ltd.
305	Fuel oil emulsion - transition fuel - low investment high performance Mr Hemant Sondhi , Fowe Eco Solutions Ltd
217	Going green thanks to hydrogen fuel. Generation of trace level calibration gases that are essential for the calibration and certification of the H2 purity analysers Mr Laurent Courthaudon , AlyTech, France
261	Nitrogen Interference in sulphur analysis of fuel and solution for true sulphur analysis in fuel Mr Rahul Iyer , Skytech Systems (India) Pvt. Ltd.
210	State-of-the-art methodology for determination of trace level of elemental sulfur in aviation fuel by polarograph Dr Y S Jhala , Indian Oil Corporation Ltd.
267	Development of differentiated fuels: Role of analytical techniques for quick and simultaneous measurement of multiple qualitative and quantitative parameters Dr Sujit Mondal , Indian Oil Corporation Ltd.

TS II C : Circular Economy Session Chair: Dr Pankaj Bhatnagar, CGM, IOC R&D	
297	Condition monitoring of regenerated lubricating oil of critical plant equipment Mr N Mondal , RDCIS, SAIL, Ranchi
247	A unique approach for quality monitoring of petroleum products at customer's doorstep through quality on wheels-mobile lab Mr R. Subramanian , Bharat Petroleum Corporation Ltd.
278	Additive company's contribution towards circular economy achieving Net Zero Mr Kailash Sawant , Lubrizol India Pvt. Ltd.
246	Circular economy in used oil waste Mr Anuj Seth , Axens group
317	Circular economy in lubricating oils Mr Peeyush Dubey , Indian Oil Corporation Ltd.

Networking Dinner

March 17, 2023 (Friday)

E-Poster Session-1 on Lubricant Technology (1230–1600 hrs) (Venue: Debate Hall)

Paper ID	Title of the Abstract	Author
211	Effect of fuel-efficient engine oil on the durability of heavy-duty diesel engines	Anand Prakash Gupta
213	1,1,3,3-Tetramethylguanidine based dicarboxylate ionic liquids as efficient additives for lubricants	Praveen K. Khatri
214	Mitigation study of foaming in high TBN marine oils -Role of defoamants in individual as well as in combined forms in controlling foaming tendency of highly polar marine lubricants	Ramanathan R
219	Circular economy & ESG in used lubricants & sectors	Bhavti Patadia
269	Next-Gen Mobile Gas Engine Oil for Indian Heavy Duty CNG Fleet Applications	Bijan Roy
228	Establishing shear stability index as per thickening efficiency model for Olefin copolymers	K. Naresh Kumar
234	Study of effect of additives on hydrolytic stability of rapeseed oil and trimethylolpropane trioleate	Shruthi K. S.
239	Effect of amine phosphates on the oxidation stability characteristics in synthetic compressor oil	Umashankar Male
240	Study on oxidation stability of lubricant base stocks by rotary bomb oxidation test and pressurised differential scanning calorimetry	Kashinath Sutar
252	Development of indigenous pour point depressants (PPDs) additive to formulate both automotive and industrial lubricants	Santosh K. Sahoo
253	Development of cost-effective heavy duty diesel engine crank-case lubricants through in-house developed soot dispersancy engine test method	Ashish Kachhawa
262	Fuel and engine oil auxiliaries: functionally modified polyisobutylenes as ash-less dispersants	Tota Rajsekhar
265	Studies on lead and copper corrosiveness of heavy duty diesel engine oils	Rajesh Nimmakauri
270	Study on ashless & zinc based bearing oils for no twist rod mills (NTM)	M. N. K. Prasad Bolisetty
272	Study on antioxidant and antiwear interaction in industrial oils	Sumit Bhaskaran
248	Reduced tendency to form sludge in oil – An effect of alkylation on phenyl and diphenyl amines antioxidants	Ashish Mishra
293	Hot Rolling oil for stainless steel	Vilas Ramtenki
304	Evaluation of long drain capability of diesel engine oils by laboratory and in-house engine testing studies	Sathyam Reddy Yasa
306	Studies on oxidation & deposit forming properties of API CI4 plus diesel engine oil with addition of biodiesel	Sandeep Kumar
349	Lifecycle enhancement of turbine oils	Arjun G Singh Tuteja



March 17, 2023 (Friday)

E-Poster Session-2 on Fuels & Additives (1600-1900 hrs) (Venue: Debate Hall)

Paper ID	Title of the Abstract	Author
226	Optimization of industrial alkaline electrolyser plant using a simulation-based approach	Rahul Garg
229	Performance evaluation of high octane fuels on BS VI motorcycle	Shyamsher Saroj
243	Synthesis of high energy-density polycyclic hydrocarbon fuel on mesoporous supported nanocatalyst	Nizamuddin Khan
263	Material compatibility studies with high octane fuels (XP100 and XP95)	Fariha Saleem
271	Combustion behaviour of octane boosters in gasoline streams on a fuel injection based single cylinder engine	Navarun Saikia
273	Value addition of LVFO as green fuel LSHS (Premium)	Manisha Saraswat
274	Study on potential FSII for application in high flash ATF Fuel (JP-5)	Kiran K. Chakrahari
282	Study of real driving emission of ethanol blended gasoline fuel with portable emission measurement equipment on rde compliant route	Chander Kant
283	Effect of Iso-Propanol as a co solvent on phase stability and volatility behavior of ethanol blended motor gasoline	Nihar Dash
285	Performance and emission characteristics of GEM fuel in a constant speed S.I. engine	M.K.Shukla
289	Green hydrogen as enabler to achieve the net zero goal	Mukul Gupta
298	A novel cost effective multi-functional corrosion inhibitor for LPG pipelines	Kottari Naresh
301	Performance evaluation of 5kW hydrogen fuel cell for heavy duty mobility	Tarun Jindal
303	Single step electrochemical production of green hydrogen blended compressed biogas	Chinmay Chaudhari
307	Investigation of combustion catalyst efficacy for heavy fuels	M Rajendran
310	Experimental investigation on performance of BS VI complaint EFI motorbike with oxygenated fuel blends (E0, E10, E20 & M15)	Yaman Sahu
312	Performance of a diesel engine using biodiesel	Senthil Kumar G
316	COx free hydrogen production through multi-walled carbon nanotubes (MWCNT) process	Bhanumurthy Samala
320	Post-Flame oxidation of unburned hydrocarbon: A review on timeline of formation of soot particle into different engine deposits	Dinesh Deva
322	A novel approach towards hydrogen generation by aqueous reforming of methanol over hydrotalcite catalysts	Meeta Sharma

Networking Dinner

March 18, 2023 (Saturday) – Schedule

Plenary Session II (0930-1100 hrs) Fuels as Enablers for Net Zero (Venue: Main Hall (Tango)) Session Chair: Dr R K Malhotra, Former Chairman, IOCL	
Mr Krishnan Sadagopan Sr. Vice President, Ashok Leyland	Hydrogen IC Engines
Dr Thomas Featherstone Team Leader (H2 Project), Infineum	Hydrogen as future fuel
Dr Rob Allan Senior Customer Technical Service Manager, AFTON	Use of diesel performance additives to restore fuel economy and performance in a modern Euro V tractor
Ms Vicky Villena-Denton Editor, F+L Asia	Achieving net zero carbon through industry advocacy

Tea

Panel Discussion II (1045-1215 hrs) Customer Perspective on Emerging Fuel & Lubricant Trends (Venue: Main Hall (Tango))	
Dr. Reji Mathai (Speaker & Moderator) Director, Automotive Research Association of India (ARAI)	Auto Industry perspectives
Mr V. Satish Kumar Director (Marketing), IndianOil	OMCs perspective on fuels and lubricant solutions
Mr C V Raman Chief Technology Officer, Maruti Suzuki	Hybrid engine technology for passenger car segment
Mr R Venkatesh Managing Director, Wartsila India	Hydrogen as future fuel for stationary energy / renewable grid scale

Lunch

Plenary Session III (1215- 1345 hrs) Oxygenated and New Generation Fuels for Mobility (Venue: Main Hall (Tango))	
Dr SSV Ramakumar (Speaker & Chair) Director (R&D), IndianOil	Future fuels and lubricants
Mr Rajendra Petkar Chief Technology Officer, Tata Motors	Hydrogen fuel cells for mobility
Mr Jorge Manes Industry Liaison Advisor, Infineum Brasil Ltd.	An overview of the Brazilian flex engine evolution and its upcoming sustainability pursuit
Prof K A Subramanian Dept of Energy Science & Engg., IIT Delhi	Oxygenated fuels enabling the decarbonisation of mobility



March 18, 2023 (Saturday)

Technical Session III (1430-1600 hrs)

TS III A: Natural Gas & Lubricants (Venue: Tango-I) Session Chair: Mr Mukul Maheshwari, CGM I/c (LT), IOC R&D	
238	Lubricant development for natural gas (NG) engines Dr Amol Nilpawar , Infineum India Additives Pvt. Ltd.
281	Dedicated mobile gas engine oil chemistries enabling long drain for CNG commercial vehicles Mr Sreehari Kumar , Lubrizol India Pvt. Ltd.
506	Liquefied natural gas: Solution towards decarbonising long haul fleets in India Dr Sauhard Singh , Indian Oil Corporation Ltd. R&D Centre.
232	Promoting clean cooking fuels in India one step towards net zero Mr Aniruddha Kulkarni , BPCL R&D

TS III B : Bio-Technology (Venue: Tango-II) Session Chair: Dr S K Puri, Former CGM, IOC R&D	
245	All Roads leading to biorefinery – A step further towards sustainable mobility and future Mr Harshit Agarwal , Axens group
260	Carbon recycling: An innovative path towards aviation decarbonization Dr Preeti Jain , LanzaTech, USA
268	Bioconversion of CO ₂ to transportation fuels Dr Prakash C. Sahoo , Indian Oil Corporation Ltd. R&D Centre.
501	Integrated biorefineries for sustainable fuels and chemicals Dr S Venkata Mohan , CSIR-IICT, Hyderabad
507	Pilot-scale production of biodegradable plastics through fermentation technology Dr M. Venkateswar Reddy , Colorado State University, USA

TS III C : Metal Working Oils (Venue: Tango-III) Session Chair: Dr Deepak Saxena, Former ED, IOC R&D	
212	Advantages of using sulfur based EP additives in metalworking fluids Mr Wilhelm Rehbein , Lanxess Deutschland GmbH
206	Experimental studies on stability and tribological performance of renewable resource based water-extendable metalworking fluids Mr Duddu Vinod Kumar , Gulf Oil International, Global R&D Centre
203	Rapid screening of rust preventive performance of lubricant Mr Prashant Parihar , Bharat Petroleum Corporation Ltd.
318	Sustainable, biobased metal working fluids (MWFs) Dr Jyoti Porwal , CSIR-Indian Institute of Petroleum
328	Field validation of innovative water based synthetic cutting fluid for auto ancillary industries Dr Simmi Datta , Indian Oil Corporation Ltd. R&D Centre.

Tea

March 18, 2023 (Saturday)

Technical Session IV (1615-1745 hrs)

TS IV A: Base Oil & Additives (Venue: Tango-I) Session Chair: Mr Debashis Ganguli, CGM (Lubes), BPCL	
204	Active behaviour of synthetic esters as anti-oxidant boosters Ms Ambika Satish , AVI-OIL India Pvt. Ltd.
292	Low viscosity low volatility synthetic basestocks "doing more with less targeting high performance european specifications" Dr Manish Patel , ExxonMobil Product Solutions
510	Coolants for modern engines as well new energy vehicles Mr Neville Colaco , BASF India Limited
235	Creating a sustainable future through innovative chemistry Mr Mohnish Shukla , Infineum India Additives Pvt. Ltd.

TS IV B : Alternative Fuels (Venue: Tango-II) Session Chair: Dr Umish Srivastava, ED, IOC R&D	
516	Alternate fuels development for marine / decarbonisation and sustainable fuels Mr Pankaj Misra , Wartsila India
280	Alternative Fuels – Preparing for the impact on marine lubricants Mr Ian Bown , Lubrizol
244	Kinetic study of thermal decomposition of monopropellant (ammonium perchlorate) Dr Harish Kumar , DMSRDE-DRDO
286	Managing the transition from fossil fuels to renewables - challenges, opportunities & implications Mr Ashok Jambur , Human Development Society

TS IV C : Refining Technology (Venue: Tango-III) Session Chair: Mr Sarvesh Kumar, CGM, IOC R&D	
201	HP-TRIJET: A tandem catalyst based technology for production of sustainable aviation fuel/green diesel from used cooking oil Dr Narasimharao Kanna , Hindustan Petroleum Corporation Ltd.
250	Steps towards net zero commitment Mr Ratheesh S , Bharat Petroleum Corporation Ltd.
255	Reducing carbon footprint of transportation fuels by processing waste plastic pyrolysis oil in refinery: sustainable approach to net zero goal Mr Shahil Siddiqui , Indian Oil Corporation Ltd. R&D Centre.
299	Dual functional surfactant/waxy containing biodegradable warm mix additive for asphalt mixtures Mr Kottari Naresh , Hindustan Petroleum Corporation Ltd.

Cultural Program & Conference Dinner



March 18, 2023 (Saturday)

E-Poster Session-3 on Alternative Fuels & e-mobility (1230–1600 hrs) (Venue: Debate Hall)

Paper ID	Title of the Abstract	Author
334	Effect of absorbing low sulphur aviation fuel as interface plug on quality of ethanol blended gasoline	Manoj Kumar Shukla
335	Physicochemical studies on aviation turbine fuel & biodiesel blends	Ravi Gajera
336	Catalytic conversion of bio-oil for the production of green transportation fuel	Sandeep K Saxena
338	Fuel storage issues in ethanol blended fuels (EBMS): A case study	Rajiv Srivastava
208	SAF - viable production process for SBCS in Indian perspective	Manish Malhan
233	Bio-based surfactant from alternative fuels: production and optimization using response surface methodology	Neha
287	Vertigo testing model for ensuring working at height to prevent fall from height of persons due to acrophobia	Ananta Bhende
323	Biohydrogen (BioH ₂) production from Biomass	Srikanth Sandipam
324	Evaluation of piston deposits, fuel economy, oil consumption and wear characteristics for developing eco-friendly new generation engine oil for light duty vehicles	Sanjeev Kumar Singh
325	Synthesis of copper nanofluids for heat transfer applications	Om Parkash
291	EV fluids -an exciting opportunity for development of novel testing units and standard protocols	Krishnaswamy N. Ponnani
333	Lignin depolymerization to produce high value chemicals	Prakram Singh Chauhan
340	Cotton seed oil-derived biolubricants for industrial applications: synthesis, physicochemical characterisation, and tribological studies	Ponnekanti Nagendramma
311	Effect of MWCNT in Lithium-ion Battery electrochemical activity	Senthilkumar Krishnan
275	New generation antifreeze coolant for electric vehicles	Naresh Gutta
314	Battery technologies for E-Mobility	Veena Yadav
337	Performance aspects of 2,5- dimethylfuran blends stratified charge gasoline direct injection (GDI) engine on lean limit operation	P.Rajkumar
224	Organosilicon-based polyisobutylene succinimide/esters as multifunctional lubricant additives	Sameeksha Raizada

March 18, 2023 (Saturday)

**E-Poster Session-4 on Refining Technology & Analytical Techniques
(1600-1900 hrs) (Venue: Debate Hall)**

Paper ID	Title of the Abstract	Author
209	State-of-the-art methodology for determination Total Aromatics in VGO samples By FTIR	Mamta Kumari
227	Detection of adulteration in biodiesel and its blends with virgin vegetable or used cooking oil from FTIR spectral analysis	Pankaj Kumar Mondal
249	Unified laboratory intelligence system (ULIS): A sustainable approach for fuels and lubricants analysis with case studies	Ravindra Kumar
264	Identification and quantification of recalcitrant molecules in industrial wastewater using GC-MS technique	Dheer Singh
294	Automated determination of relative density of methanol/water mixtures (MWM) used in aviation industry	Sreekumar N V
300	Multi-dimensional chromatographic analysis for molecular level characterization of bio-oil.	Kottari Naresh
202	HP-Bottoms cracking additive for FCCU	Somanath Kukade
223	Comparitive performance evaluation of commercial and inhouse synthesized wax dispersant on wax deposition behavior of Upper Assam Basin crude Oil	Manisha Sahay
242	Waste to BS-VI fuels as enabler for net zero	P. Naresh
254	Thermal co-carbonization study of petroleum residues and coal tar pitch for production of electrode material for aluminium industry	Mr Prantik Mondal
295	Evaluation of heavy metals in north Gujarat crude & their toxic effect in treated industrial effluent water	Bhawana Srivastav
296	A unique antifouling solution for refinery preheat exchangers to improve operational efficiency and reduce GHG emissions	Eswararao Doni
350	Microwave-based economical biodiesel production in India	Amit Pal
308	HP DWA: A cost effective and novel dewaxing aid polymer for lube refinery, A make in India Initiative	Ch. Siva Kesava Raju
361	CO combustion promoter in FCC unit: Influence of metal dispersion on performance	Manjunathan P
362	Lab studies for assessing the energy efficiency of the industrial gear oils	Sandeep Singh
241	Experimental study of in-cylinder flame characteristics of butanol-gasoline blends in SI engine using endoscopic visualization system	S.Kumaravel

Cultural Program & Conference Dinner



March 19, 2023 (Sunday) – Schedule

Technical Session V-A (0900-1015 hrs)

TS V A: Operating Fluids for EVs (Venue: Tango-I) Session Chair: Mr Prakash Rao, Principal Chief Engineer (PT- ICE & EV), Mahindra & Mahindra	
315	Nano fluid coolant for automotive cooling applications Mr Kiran N , Ashok Leyland Ltd.
216	Managing the challenges of cooling electrical vehicles and their systems Mr Amol Chore , Arteco Coolants India Pvt Ltd.
279	e-fluid technology for electrified drivetrains Mr Nilesh Kadu , Lubrizol India Pvt. Ltd.
321	Development of dedicated transmission lubricants for electric vehicles Dr Lakshmi Katta , Indian Oil Corporation Ltd. R&D Centre.

TS V B: H2 as future fuel (Venue: Tango-II)	
517	Optimal exhaust after treatment solutions for H2-ICE Dr Shravan Srisailam , BASF Catalysts India Pvt Ltd
504	Decoding hydrogen ecosystem for India Mr Sachin Chugh , Indian Oil Corporation Ltd. R&D Centre.
351	Hydrogen ICEs for commercial on-road and off-road applications: realization of robust and cost-effective carbon free combustion engines Dr.-Ing. Om P Bhardwaj , FEV Europe GmbH
302	Effect of low temperature and low humidity on Nafion based membrane electrode assembly for PEM fuel cell S. Meenakshi , Indian Oil Corporation Ltd. R&D Centre.

TS V C: Greases (Venue: Tango-III) Session Chair: Dr T Singh, DGM, BPCL R&D	
319	Developing & validating an automotive grease : beyond field trials Mr Pallav Chatterjee , Tata Motors
290	New approaches to understanding critical grease properties with novel investigative equipment Prof. Krishnaswamy N. Ponnani , Labcon Scientific Instruments
225	Evaluation of CNTs in lubricating greases Dr Sayantan Das , Indian Oil Corporation Ltd. R&D Centre.
230	Study on the application of novel rosin ester as potential eco-friendly multifunctional additive in polyol based grease Mr Ripudaman Singh Negi , CSIR-Indian Institute of Petroleum

Tea

March 19, 2023 (Sunday)

Plenary Session IV (1030-1200 hrs)

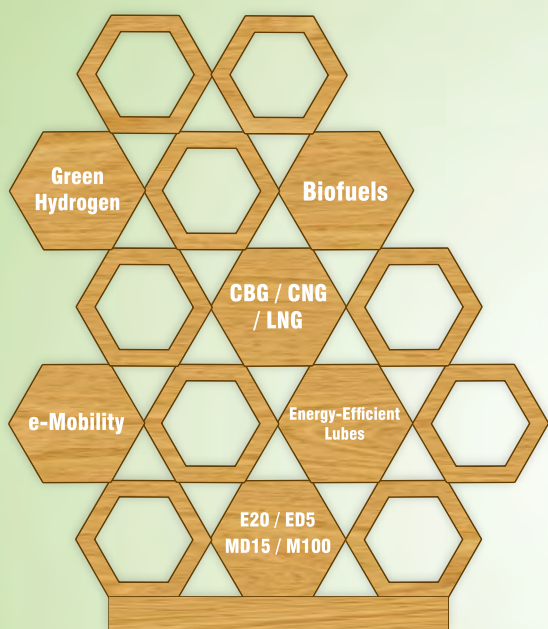
Plenary Session – IV (Venue: Main Hall (Tango)) E-mobility	
Mr. Saurabh Dalela (Speaker & Chair) Director, International Centre for Automotive Technology (iCAT)	Government initiatives & standards for e-mobility
Dr Tapan Sahoo Executive Director (Engineering), Maruti Suzuki	Electric mobility in passenger vehicle segment
Mr. Prakash Rao Principal Chief Engineer, Power Train ICE & EV, Mahindra & Mahindra	EV application, challenges and possible solutions – India Perspective
Mr Sanjeev Gupta Chairman (IOP) and ED (Corporate Strategy), IndianOil	Alternate battery chemistries for electric mobility

Valedictory Function (1215- 1315 hrs)

Valedictory Function (Venue: Main Hall (Tango))		
1215 – 1225 hrs	Welcome Address	Dr SSV Ramakumar Chairman, NSC, ISFL 2023 & Director(R&D), IndianOil
1225 – 1245 hrs	Conference Summary	Shri Mukul Maheshwari Convener-cum-Organizing Secretary, ISFL 2023 CGM I/c (LT), IndianOil R&D
1245 – 1305 hrs	Valedictory Address by Chief Guest	Dr Anjan Ray Director, CSIR – Indian Institute of Petroleum (IIP)
1305-1315 hrs	Vote of Thanks	

Lunch

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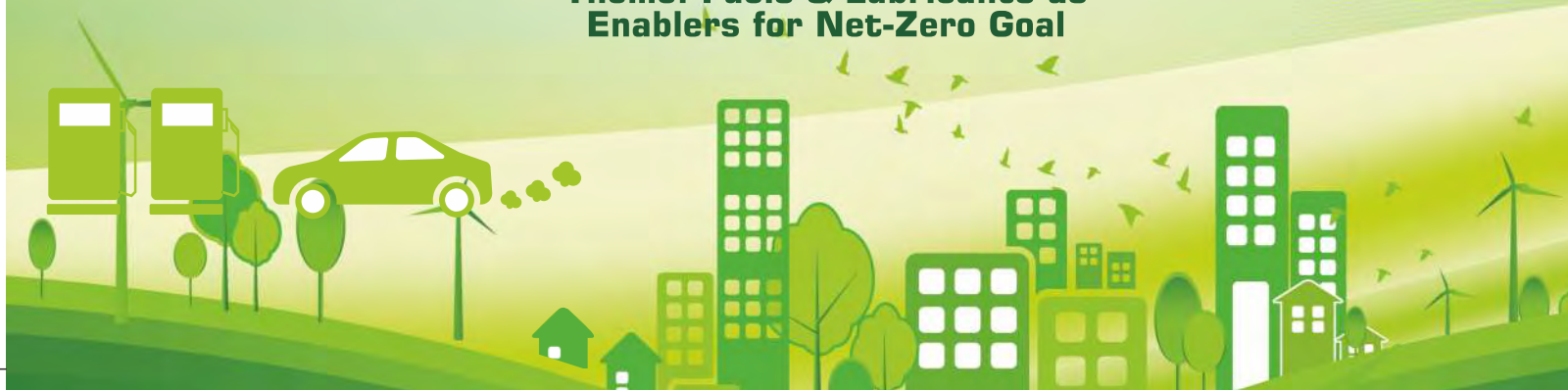
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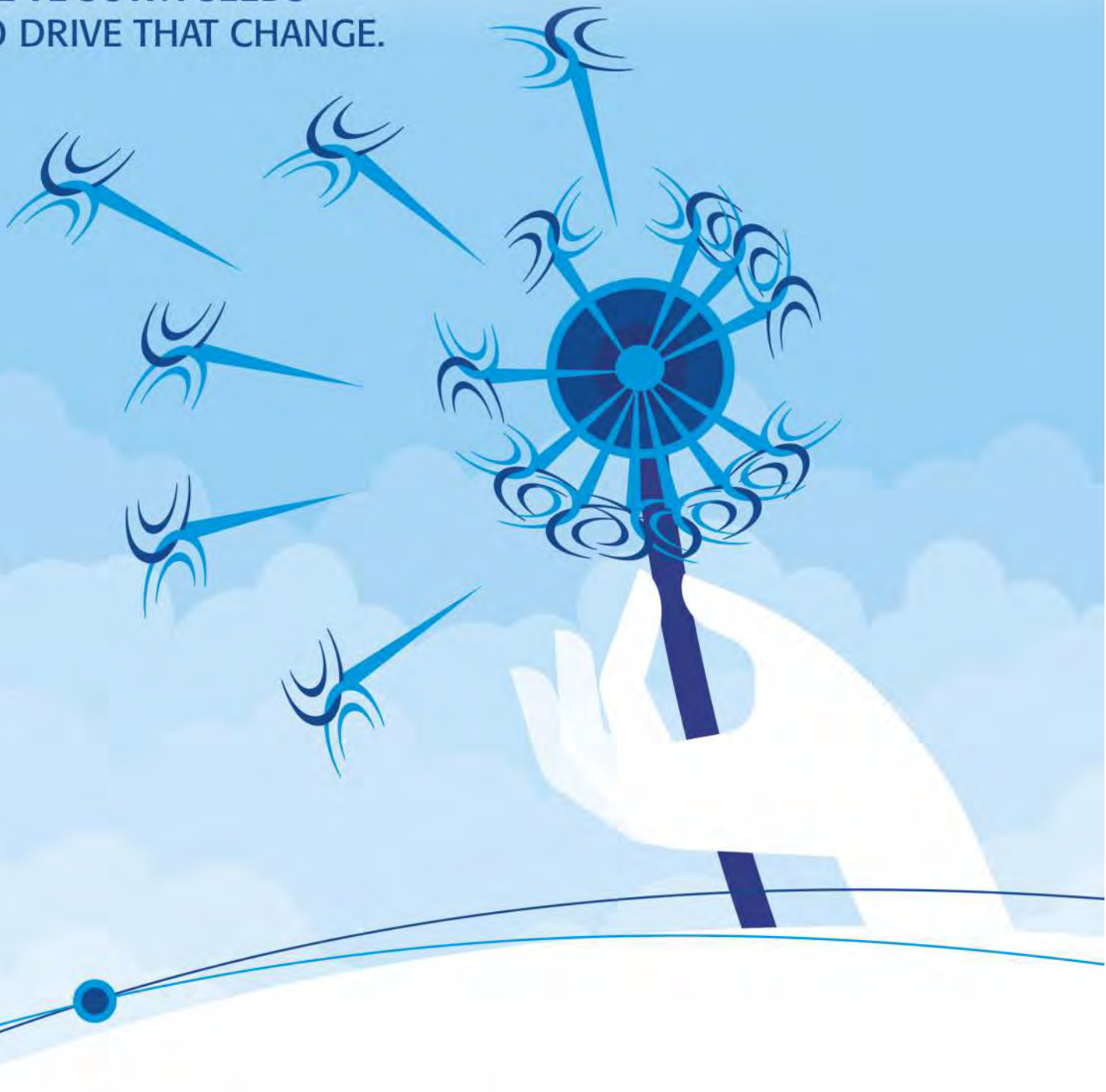


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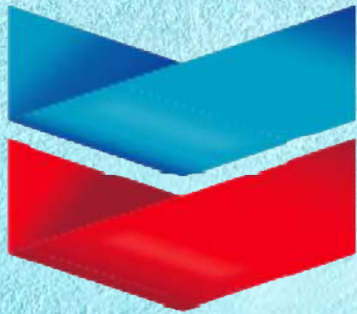
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*Source: India Lubricant Market Analysis, Kline Report 2021

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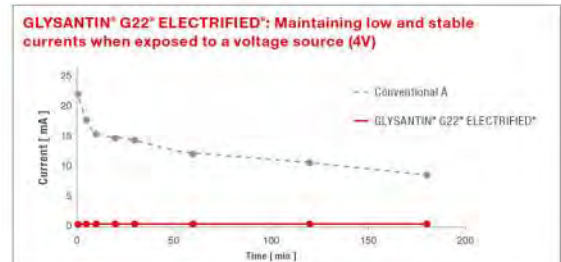
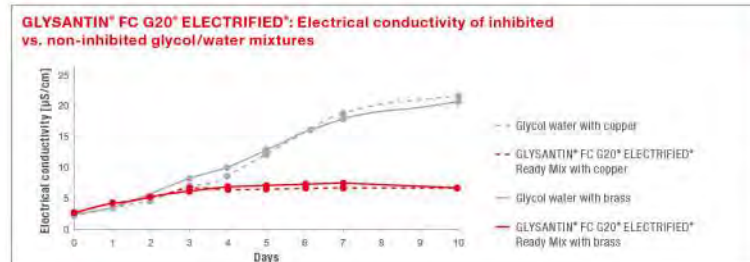
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
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